

A round-up of the eye related hot topics that have been trending on social media over the last few weeks.

#cataracts #holography #simulation

Cataracts are the major cause of blindness globally and innovating novel management strategies remains as important as ever [1]. Engineers and clinicians from the department of electrical engineering and translational medicine research centre at Koc University in Istanbul have used computer generated holography (CGH) to provide a preoperative glimpse at postoperative eyesight for cataract patients. Specialised techniques used when working up such patients including biometry, aberrometry and retinoscopy cannot predict postoperative visual acuity. The display technology in their visual simulator offers natural three-dimensional vision along with depth and focus cues [2]. This is facilitated through digital control of the phase, size and shape of the light beam entering their pupils. The visual simulator detects non-cataractous areas on the crystalline lens and directs light beams containing a virtual Snellen chart through these areas onto the retina. Existing refractive errors were also corrected at this point. Ten patients used the simulator and all showed an improvement in their visual acuity when compared to results of conventional eye examinations. However, the absence of postoperative testing for comparison with simulator data was a major limiting factor. Nonetheless, their vision simulator outperformed other existing analogous methods and may help match patients with their most suitable intraocular lens [3].

#myopia #optometry #COVID-19

The COVID-19 pandemic has profoundly impacted the lives of those from all age groups. Researchers in Hong Kong have recently demonstrated an association between the pandemic and the increased incidence of myopia in six- to eight-year-old children [4]. The study published in the *British Journal of Ophthalmology* recruited 709 children and aimed to investigate myopia and lifestyle changes during the pandemic from January 2020 to August 2020.

Environmental factors such as time spent outdoors and 'screen time' play a pivotal role in its development and provide the context for this study. During lockdown schools and parks were closed, diverting children to spend time inside engaging in 'near work' such as looking at screens. This study tested children's eyesight before and after the described lockdown period and used complementary questionnaires to gather information about behaviour such as time spent outdoors or using screens [5].

They found that 19% of children developed myopia over this time which was greater than expected when compared to pre-COVID-19 cohort data. This corresponded with a 68% decrease in time spent outdoors and an almost three-fold increase in screen time. Based on this, the researchers predicted a 29% incidence

of myopia in six- to eight-year-olds over a year of lockdown. Previous cohort data would suggest an incidence of 13% in the same age group [4]. This corroborates a large cohort study on mainland China looking at more than 123,000 children of the same age group, which showed a significant myopic shift during the COVID-19 pandemic [6].

However, these findings represent an association rather than a causative link and are also likely not to be globally scalable due to the wide variation in countries' lockdown measures [7].

#noveltherapy #VEGF

#neovascularisation

A significant step may have been made towards improving the treatment of age-related macular degeneration and diabetic retinopathy, both leading causes of blindness. Chinese and Australian scientists have tested a novel treatment in animals and have published their encouraging findings in *Nature Biomedical Engineering* [8]. Ocular neovascular disease has a global burden of approximately 450 million and as our population continues to age this will rise significantly. Currently ocular neovascularisation can be suppressed with locally injected sequential biological therapies targeting vascular endothelial growth factor (VEGF). Approximately half of such patients do not respond well and may go on to develop new bleeding or fail to recover useful vision. The animal models used in this study showed a reduction in the volume of analogous lesions by 95%. Furthermore, this novel therapy is effective after only a single injection. Anti-VEGF antibodies were combined with bespoke exosomes, which selectively accumulate in areas of neovascularisation and therefore target the pioneering treatment. The researchers hope that their findings will translate into effective treatment by improving eyesight and preventing blindness for those with age-related macular degeneration or diabetic retinopathy.

#birdattack #eyepatch #Hitchcock

In a disconcerting homage to Hitchcock's famous motion picture, an Australian lady almost lost her sight after being attacked by a bird. Debbie Jones was enjoying breakfast at the Pretty Handsome café in Gold Coast, Queensland while sharing her toast with the beaked perpetrator when the event took place. The aptly named "butcherbird" landed a choice peck, only narrowly missing her eye. "I started to run down the road; there was all blood pouring down my face," Ms Jones said. Although she did not sustain any sight-changing injuries she will wear an eyepatch until her wounds heal. Despite this facial assault Ms Jones asserts that she will continue to feed birds [9].

#LauraCollett #eventing #Tokyogold

Laura Collett and her teammates Oli Townend and Tom McEwen won Team GB's first eventing gold since 1972 at the Tokyo Olympics [10]. What is even more remarkable is that she is blind in her right eye following an accident during a cross country competition in 2013 [10,11]. Her horse had misread the corner and landed on top of her, causing extensive injuries including a shoulder fracture, fractured ribs, pneumothorax, punctured liver and kidney injuries [11]. It sounds as though she suffered from a fat embolus from her shoulder fracture, which resulted in right optic nerve damage and the loss of her sight in this eye [11]. Following rehabilitation she resumed competition and what a comeback she's had! Congratulations!

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